

REMARKS

Upon entry of this Amendment, claims 1-39 are all the claims pending in the application. Claims 28- 39 have been added. Claims 5, 11-20, 23-25 and 27 are withdrawn from consideration as being drawn to a non-elected invention. Claims 1, 4, 6, 8, 22 and 26 presently stand rejected. Applicant thanks the Examiner for acknowledging that claims 2, 3, 7, 9, 10 and 21, although presently objected to as being dependent upon a rejected base claim, would be allowable if rewritten in independent form.

A provisional election of claims 1-4, 6-10, 21, 22 and 26 was made on August 6, 2003. Applicant hereby affirms this election and reserves the right to file the non-elected claims at a future time.

Claim Objections

Claims 6 and 10 are objected to because of informalities. Applicant has amended claims 6 and 10 to address these objections. Withdrawal of the objections is kindly requested.

§112 Claim Rejections

Claim 6 is rejected under 35 U.S.C. § 112, second paragraph. Applicant has amended claim 6 to address this rejection. Applicant submits that claim 6 now satisfies all requirements of 35 U.S.C. §112. Accordingly, the §112 rejection of claim 6 should be withdrawn.

§103 Claim Rejections

Claims 1, 4, 8, 22 and 26 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Chiu et al. (USP 4,539,689) and further in view of McCool et al. (USP 4,238,746). For the

reasons set forth below, Applicant respectfully traverses the rejection and requests favorable disposition of the claims.

Lack of Prima Facie Case

Applicant respectfully submits that the Examiner has failed to put forth a prima facie case of obviousness based on the Chiu et al. and McCool et al. references. Specifically, in contravention of well-established law, the Examiner has failed to provide support, from within the disclosures of either of the asserted prior art references, for the assertion that one skilled in the art would have combined their respective independent teachings. As stated by the Court of Appeals for the Federal Circuit:

[A] rejection cannot be predicated on the mere identification . . . of individual components of claimed limitations. Rather, particular findings must be made as to the reason the skilled artisan, with no knowledge of the claimed invention, would have selected these components for combination in the manner claimed.

(*In re Werner Kotzab*, 217 F.3d 1365, 1371, 55 U.S.P.Q.2D (BNA) 1313, 1317 (Fed. Cir. 2000)).

Here, the Examiner has merely stated that the combination of independent features would have been obvious, without providing any explanation as to the reasoning behind the assertion. For at least this reason the §103 rejection should be withdrawn.

Furthermore, Applicant submits that the proposed combination of Chiu et al. and McCool et al. is inappropriate for §103 purposes. Specifically, based on the disclosures of Chiu et al. and McCool et al., a skilled artisan would not have been motivated to combine the technique of developing “optimum equalizer tap settings” through cross-correlating and auto-correlating in-

phase and quadrature phase components of a received impulse response, as disclosed in Chiu et al., with a technique in which an input signal and a filtered delayed version of the input signal are summed and the result of the summing operation is amplified and used to readjust the filter weights, as disclosed in McCool et al.

As stated by the Court of Appeals for the Federal Circuit:

It is impermissible to use the claimed invention as an instruction manual or "template" to piece together the teachings of the prior art so that the claimed invention is rendered obvious. This court has previously stated that "[o]ne cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention."

(*In re Fritch*, 972 F.2d 1260, 23 USPQ 2d 1780, 1784 (Fed. Cir. 1992) (quoting *In re Fine*, 837 F.2d 1071, 1075, 5 USPQ 2d 1596, 1600 (Fed. Cir. 1988))).

Here, the examiner has clearly engaged in impermissible hindsight reconstruction by forcibly injecting the use of estimating the magnitude and polarity of the noise portion of the received signal, as allegedly taught in McCool et al., into the technique disclosed in Chiu et al. The examiner asserts that "it would have been obvious to one of ordinary skill in the art at the time of this application to increase the signal to noise ratio of the wireline receiver [of Chiu] by iteratively processing the in-phase and quadrature versions of the received signal to produce a noise estimate which is subtracted from the received signal, thereby producing a noise-reduced signal." In other words, the Examiner is simply asserting, without any support whatsoever, that it would have been obvious to combine the independent teachings of Chiu et al. and McCool et al. to achieve the claimed invention. However, there is nothing within the disclosures of either

reference, and the examiner does not point to anything, that would have motivated a skilled artisan to combine the references in the manner proposed.

For this additional reason the proposed combination of Chiu et al. and McCool et al. is improper for rendering obvious any of the claims of the present application. Accordingly, withdrawal of the §103 rejection is respectfully requested.

Lack of Recited Elements

Additionally, as disclosed and claimed in the present application, a novel and non-obvious method of improving the signal-to-noise ratio (S/N) in wired systems has been discovered. In particular, it has been discovered that by using the so-called “topological numerical array” (TNA), a significant reduction in broadband noise, i.e., noise that is not dependent on spectral and probability densities, can be drastically reduced, if not eliminated. Computer simulations of the claimed invention have proven that the method disclosed and claimed is more robust than previous “filtering” methods, such as the methods disclosed in both Chiu et al. and McCool. et al.

For example, in the present invention, nearly identical results, i.e., S/N improvement, have been achieved in the presence of various types of noise, for example, Uniform Gaussian, Truncated Rayleigh, Truncated Logarithmic and Truncated Exponential. As a result, a much larger S/N times Bandwidth product is achieved which accounts for the very large improvements in overall noise reduction. Another significant result of the disclosed and claimed method is that a rapidly fluctuating input signal can be handled wherein previously such a signal would cause significant problems.

Thus, to make explicit in the claims that which was already implicit, Applicant has amended claim 1 to recite the requirement that the noise-reduced signal achieved via novel iterative process is a broadband signal exhibiting a significant reduction in all types of relevant noise. Applicant has made this amendment merely to clarify that which was already claimed in claim 1. No *Festo*-type implications are invoked by this amendment since the amendment is not for reasons of patentability and the scope of the claim has not been narrowed.

The alleged iterative process disclosed in McCool et al. utilizes time delays to form a transversal filter. This type of transversal filter is well documented and is clearly a narrow bandwidth filter. For example, as disclosed at col. 1, lines 34-36, “the enhancer forms a narrowband filter in which the passband is centered on the frequency of the input spectral line.” Therefore, in McCool et al., unlike in the claimed method, any signal to noise reduction depends upon the spectral properties of the signal with respect to the noise.

Accordingly, because none of the prior art references of record, either alone or in combination, teach or suggest the recited combination of steps as set forth in claim 1, claim 1 is patentable over the asserted prior art and the rejection of claims 1, 4, 8, 22 and 26 should be withdrawn.

Patentability of New Claims

For additional claim coverage merited by the scope of the invention, Applicant has added new claims 28-39. Applicant submits that the prior art does not disclose, teach, or otherwise suggest the combination of features contained therein.


AMENDMENT UNDER 37 C.F.R. § 1.111
U.S. Appln. No. 09/665,658

Conclusion

In view of the foregoing remarks, the application is believed to be in form for immediate allowance with claims 1-39 and such action is hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, he is kindly requested to **contact the undersigned** at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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